

AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Please cancel claims 1, 6-13, 26-31, 39, and 55-58.

Claims 45-54 and 59-61 were cancelled in a prior amendment.

1. (Cancelled)

2. (Currently amended) An adhesion promotion composition for enhancing adhesion between a copper conducting layer and a dielectric material during manufacture of a printed circuit board, the adhesion promotion composition comprising a corrosion inhibitor, an inorganic acid, an oxidizing agent, and an alcohol which is effective to increase copper-loading in the composition, and the adhesion promotion composition being initially substantially free of transition metals having a tendency to destabilize the oxidizing agent. ~~The adhesion promotion composition of claim 1 wherein the alcohol is selected from the group consisting of monohydric alcohols.~~

3. (Currently amended) The adhesion promotion composition of claim ~~[[4]]~~ 2 wherein the alcohol ~~is selected from the group consisting of monohydric alcohols and~~ constitutes between about 0.5 wt% and about 20 wt% of the composition.

4. (Currently amended) The adhesion promotion composition of claim ~~[[4]]~~ 2 wherein the alcohol is selected from the group consisting of oligomeric monohydric alcohols.

5. (Currently amended) The adhesion promotion composition of claim ~~[[4]]~~ 3 wherein the alcohol is ~~selected from the group consisting of oligomeric monohydric alcohols and~~ constitutes between about 0.5 wt% and about 20 wt% of the composition.

6 - 13. (Cancelled)

14. (Currently amended) An adhesion promotion composition for enhancing adhesion between a copper conducting layer and a dielectric material during manufacture of a printed circuit board, the adhesion promotion composition comprising a corrosion inhibitor, an inorganic acid, an oxidizing agent, and an alcohol which is effective to increase copper-loading in the composition, and the adhesion promotion composition being initially substantially free of transition metals having a tendency to destabilize the oxidizing agent, ~~The adhesion promotion composition of claim 4~~ wherein the alcohol is selected from the group consisting of primary alcohols.

15. (Currently amended) The adhesion promotion composition of claim ~~[[4]]~~ 14 wherein the alcohol is ~~selected from the group consisting of primary alcohols and~~ constitutes between about 0.5 wt% and about 20 wt% of the composition.

16. (Currently amended) The adhesion promotion composition of claim ~~[[4]]~~ 14 wherein the alcohol is selected from the group consisting of oligomeric primary alcohols.

17. (Currently amended) The adhesion promotion composition of claim ~~[[4]]~~ 16 wherein the alcohol is ~~selected from the group consisting of oligomeric primary alcohols and~~ constitutes between about 0.5 wt% and about 20 wt% of the composition.

18. (Currently amended) An adhesion promotion composition for enhancing adhesion between a copper conducting layer and a dielectric material during manufacture of a printed circuit board, the adhesion promotion composition comprising

a corrosion inhibitor, an inorganic acid, an oxidizing agent, and an alcohol which is effective to increase copper-loading in the composition, and the adhesion promotion composition being initially substantially free of transition metals having a tendency to destabilize the oxidizing agent. ~~The adhesion promotion composition of claim 4 wherein the alcohol is selected from the group consisting of secondary alcohols.~~

19. (Currently amended) The adhesion promotion composition of claim [[4]] 18 wherein the alcohol ~~is selected from the group consisting of secondary alcohols and~~ constitutes between about 0.5 wt% and about 20 wt% of the composition.

20. (Currently amended) The adhesion promotion composition of claim [[4]] 18 wherein the alcohol is selected from the group consisting of oligomeric secondary alcohols.

21. (Currently amended) The adhesion promotion composition of claim [[4]] 20 wherein the alcohol ~~is selected from the group consisting of oligomeric secondary alcohols and~~ constitutes between about 0.5 wt% and about 20 wt% of the composition.

22. (Currently amended) An adhesion promotion composition for enhancing adhesion between a copper conducting layer and a dielectric material during manufacture of a printed circuit board, the adhesion promotion composition comprising a corrosion inhibitor, an inorganic acid, an oxidizing agent, and an alcohol which is effective to increase copper-loading in the composition, and the adhesion promotion composition being initially substantially free of transition metals having a tendency to destabilize the oxidizing agent. ~~The adhesion promotion composition of claim 1 wherein the alcohol is selected from the group consisting of tertiary alcohols.~~

23. (Currently amended) The adhesion promotion composition of claim ~~[[4]]~~ 22 wherein the alcohol is ~~selected from the group consisting of tertiary alcohols and~~ constitutes between about 0.5 wt% and about 20 wt% of the composition.

24. (Currently amended) The adhesion promotion composition of claim ~~[[4]]~~ 22 wherein the alcohol is selected from the group consisting of oligomeric tertiary alcohols.

25. (Currently amended) The adhesion promotion composition of claim ~~[[4]]~~ 24 wherein the alcohol is ~~selected from the group consisting of oligomeric tertiary alcohols and~~ constitutes between about 0.5 wt% and about 20 wt% of the composition.

26 - 31. (Cancelled)

32. (Currently amended) An adhesion promotion composition for enhancing adhesion between a copper conducting layer and a dielectric material during manufacture of a printed circuit board, the adhesion promotion composition comprising a corrosion inhibitor, an inorganic acid, an oxidizing agent, The adhesion promotion composition of claim 1 further comprising an anionic surfactant , and an alcohol which is effective to increase copper-loading in the composition, and the adhesion promotion composition being initially substantially free of transition metals having a tendency to destabilize the oxidizing agent .

33. (Currently amended) The adhesion promotion composition of claim 1 ~~further comprising an anionic surfactant~~ 32 wherein the anionic surfactant is selected from the group consisting of polymeric, oligomeric, and monomeric alcohol derivatives.

34. (Currently amended) The adhesion promotion composition of claim 1 ~~further comprising an~~ 32 wherein the anionic surfactant selected from the group consisting of alcohol sulfates, sulfonates, and ethoxylates.

35. (Currently amended) An adhesion promotion composition for enhancing adhesion between a copper conducting layer and a dielectric material during manufacture of a printed circuit board, the adhesion promotion composition comprising a corrosion inhibitor, an inorganic acid, an oxidizing agent, ~~The adhesion promotion composition of claim 1 further comprising~~ dodecylbenzene sulfonic acid (DDBSA) as an anionic surfactant , and an alcohol which is effective to increase copper-loading in the composition, and the adhesion promotion composition being initially substantially free of transition metals having a tendency to destabilize the oxidizing agent .

36. (Currently amended) An adhesion promotion composition for enhancing adhesion between a copper conducting layer and a dielectric material during manufacture of a printed circuit board, the adhesion promotion composition comprising a corrosion inhibitor, an inorganic acid, an oxidizing agent, ~~The adhesion promotion composition of claim 1 further comprising~~ a nonionic surfactant , and an alcohol which is effective to increase copper-loading in the composition, and the adhesion promotion composition being initially substantially free of transition metals having a tendency to destabilize the oxidizing agent .

37. (Original) The adhesion promotion composition of claim 36 wherein the nonionic surfactant is an ethoxylated alcohol derivative.

38. (Original) The adhesion promotion composition of claim 37 wherein the nonionic surfactant is polyoxyethylene nonylphenol.

39. (Cancelled)

40. (Currently amended) An adhesion promotion composition for enhancing adhesion between a copper conducting layer and a dielectric material during

manufacture of a printed circuit board, the adhesion promotion composition comprising a corrosion inhibitor, an inorganic acid, an oxidizing agent, and an alcohol which is effective to increase copper-loading in the composition, and the adhesion promotion composition being initially substantially free of transition metals having a tendency to destabilize the oxidizing agent. ~~The adhesion promotion composition of claim 1~~ wherein the inorganic acid is a mixture of sulfuric acid and nitric acid and constitutes at least about 30 wt% of the composition.

41. (Currently amended) The adhesion promotion composition of claim [[4]] 40 further comprising an anionic surfactant and a nonionic surfactant; wherein the inorganic acid is [[a]] said mixture of sulfuric acid and nitric acid and constitutes at least about 30 wt% of the composition; and wherein the alcohol is selected from the group consisting of monohydric alcohols, dihydric alcohols, trihydric alcohols, primary alcohols, secondary alcohols, and tertiary alcohols and constitutes between about 0.5 wt % and about 20 wt% of the composition.

42. (Original) The adhesion promotion composition of claim 41 wherein the copper-loading of the composition is characterized by less than about 0.1 volume % of Cu-containing sludge being formed at 120 hours under ambient conditions when the composition is loaded with between 40 and 50 g/liter Cu ions.

43. (Currently amended) An adhesion promotion composition for enhancing adhesion between a copper conducting layer and a dielectric material during manufacture of a printed circuit board, the adhesion promotion composition comprising a corrosion inhibitor, an inorganic acid, an oxidizing agent, and an alcohol which is effective to increase copper-loading in the composition, and the adhesion promotion composition being initially substantially free of transition metals having a tendency to destabilize the oxidizing agent. ~~The adhesion promotion composition of claim 1~~ wherein the composition is substantially free of thiourea-based complexing agents, and the corrosion inhibitor is benzotriazole, the inorganic acid comprises sulfuric acid and nitric

acid, the oxidizing agent is hydrogen peroxide, and the alcohol is triethylene glycol in the following proportions by weight percent:

0.5 to 8 wt% H_2O_2

16 to 25 wt% H_2SO_4

0.1 to 10 wt% HNO_3

0.1 to 2 wt% 1,2,3-benzotriazole

0.01 to 5 wt% triethylene glycol.

44. (Currently amended) The adhesion promotion composition of claim 43 4 wherein the composition is substantially free of thiourea based complexing agents, and the corrosion inhibitor is benzotriazole, the inorganic acid comprises sulfuric acid and nitric acid, the oxidizing agent is hydrogen peroxide, and the alcohol is triethylene glycol in the following proportions:

~~0.5 to 8 wt% H_2O_2~~

~~16 to 25 wt% H_2SO_4~~

~~0.1 to 10 wt% HNO_3~~

~~0.1 to 2 wt% 1,2,3-benzotriazole~~

~~0.01 to 5 wt% triethylene glycol;~~

— and wherein the composition further comprises the following:

0.05 to 2 wt% 2-ethyloxosulfonate

0.0001 to 2 wt% dodecylbenzene sulfonic acid

0.0001 to 2 wt% polyoxyethylene nonylphenol.

45 - 54. (Cancelled)

55-58. (Cancelled)

59-61. (Cancelled)

62. (Previously presented) An adhesion promotion composition for enhancing adhesion between a copper conducting layer and a dielectric material during manufacture of a printed circuit board, the adhesion promotion composition comprising a corrosion inhibitor, an inorganic acid, an oxidizing agent, and dodecylbenzene sulfonic acid (DDBSA), and the adhesion promotion composition being initially substantially free of transition metals having a tendency to destabilize the oxidizing agent.

63. (Previously presented) An adhesion promotion composition for enhancing adhesion between a copper conducting layer and a dielectric material during manufacture of a printed circuit board, the adhesion promotion composition comprising a corrosion inhibitor, an inorganic acid, an oxidizing agent, and sodium 2-ethylhexyl sulfate, and the adhesion promotion composition being initially substantially free of transition metals having a tendency to destabilize the oxidizing agent.

64. (Previously presented) An adhesion promotion composition for enhancing adhesion between a copper conducting layer and a dielectric material by formation of an organometallic conversion coating during manufacture of a printed circuit board, the adhesion promotion composition comprising a corrosion inhibitor, an inorganic acid, an oxidizing agent, and polyoxyethylene nonylphenol, and the adhesion promotion composition being initially substantially free of transition metals having a tendency to destabilize the oxidizing agent.